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ABSTRACT

Factors contributing to the academic persistence of college students and those factors that may be amenable to institutional control were studied in 1980 at Georgia State University. The academic career of 4,481 students was studied for a 5-quarter period at this nonresidential, urban university. Multiple regression and multiple discriminant analyses were performed on indicators of academic status, demographic background, course context, academic program, and course subject area. It was found that: (1) students likely to attend more quarters had higher grade point averages (GPAs) in their first quarter and that their GPAs increased over time; (2) students who indicated a change of address attended more quarters; (3) students who never received university financial aid attended fewer quarters; (4) students receiving veterans' benefits withdrew less frequently from courses, as did foreign students; (5) students enrolled in classes with high withdrawal rates seemed to withdraw more, while those in courses enrolling students with higher average GPAs and courses in which higher average class grades were given attended more quarters; (6) students attended more when they were in classes having a high proportion of nonminority males; and (7) students who attended fall quarter and students who attended all five quarters in the study period were more accurately predicted than students who fell in between these extremes. It is concluded that persistence is a problem involving social adaptation, and a good measure of this adaptation is first quarter academic performance. Findings from other related studies and implications of the findings are examined in detail. (SW)

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PERSISTENCE TOWARD A DEGREE IN
URBAN NONRESIDENTIAL UNIVERSITIES

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D. R. Coleman, Chairman
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Abstract

PERSISTENCE TOWARD A DEGREE IN URBAN NONRESIDENTIAL UNIVERSITIES

Persistence toward a college degree is an important problem for higher education in a time of increasingly scarce resources. This study follows the academic career of over 4,000 students for a five-quarter period at an urban, non-residential university. Multiple regression and multiple discriminant analyses were performed on indicators of academic status, demographic background, course context, academic program, and course subject area. Post enrollment factors such as first quarter GPA are shown to be primary predictors of persistence. Course context also plays an important role. The findings considered as a whole suggest persistence is strongly influenced by student adaptability.

PERSISTENCE TOWARD A DEGREE IN
URBAN NONRESIDENTIAL UNIVERSITIES

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Introduction

As concerns about declining enrollment and questions about the cost-effectiveness of programs increase at colleges and universities, the efficiency with which students achieve their academic goals has come under intensified scrutiny. This academic efficiency has been discussed under various titles, such as "retention," "attrition," and "persistence." Such research has usually portrayed a grim picture of the ability of an institution to significantly influence student persistence in a degree program. Factors outside the institution's control--including scholastic aptitude and family background--have typically been cited as key elements affecting a student's withdrawal from a degree program.

The implications of these studies are important for the institution as well as the individual student. Policy and curriculum planning which incorporates the "persistence" factor will benefit students by decreasing time previously wasted in false starts and faltering progress. If colleges and universities can formulate policy adjustments which affect persistence, then enrollments can be maintained and increased through the reduction of "stop out" and "drop out" rates.

Purpose

This study has three objectives: (1) to determine which factors contribute to the academic persistence of students; (2) to examine the extent to

which persistence is a product of individual students and/or contextual factors; (3) to identify those factors amenable to institutional control. It is hoped that this research may be used as an aid by administrators such as academic vice-presidents and deans in their planning process.

Review of the Literature

Although student persistence is a complex phenomenon, recent research clearly indicates that type of institution and degree program play a vital role in the persistence of students. Program of study is an especially important influence on persistence. Vocationally-oriented students are more likely to persist, even when performing poorly in their programs (Simpson, Baker, & Mellinger, 1980). Additional factors influencing persistence have been pinpointed. These include working while attending college (Anderson, 1981), living at home (Chickering, 1975), and the search for maturity and independence (Simpson, et al., 1980). Students in commuter schools have displayed lower persistence than those in residential institutions (Anderson, 1981).

Higher education persistence studies also relate to the more general functions of productivity, goal achievement, and adaptation. In terms of productivity, the study of persistence identifies the relative importance of factors impinging on attaining a finished product--in the case of this study, a college degree. In terms of goal achievement, a study of persistence can identify salient factors for theoretical models such as Spady (1971), Tinto (1975), and Bean (1980) have suggested. Empirical testing and validation of some conceptual elements of these models by Terenzini and Pascarella (1979, 1980) and others demonstrates the need for further research.

Data

A total of 4,481 students who had initially entered GSU in Fall, 1980, were selected for the student data base. The academic careers of these students were followed for a five-quarter period.

Methods

Multiple regression and multiple discriminant analyses were performed on indicators of student persistence over this five-quarter period. These dependent variables include total number of quarters attended out of the five, total number of courses from which the student withdrew, total number of credit hours attempted, and last quarter attended. The independent variables are grouped into five clusters: (1) indicators of student characteristics such as academic status, (2) demographic background, (3) course context, (4) academic program, and (5) course subject area.

Findings

The multiple regression results are presented in Table 1. They include both the standardized and unstandardized regression coefficients for the four independent variables. The relationship of the independent variables to the dependent variables will be presented according to the five groupings of the independent variables. The results of the regressions in Table 1 will be discussed first.

Academic Status

Various measures of academic status have been shown in most persistence studies to be related to persistence in college. This current research is no exception. The key relationships are:

Table 1

Unstandardized and Standardized Regression Coefficients for Measures of Persistence over Time
With Academic Status, Demographic Background, Course Context, Academic Program, and Course Subject Area

Variables	UNSTANDARDIZED				STANDARDIZED			
	Total Quarters	Last Quarter Attended	Total Credit Hours Attempted	Total Courses Withdrawn	Total Quarters	Last Quarter Attended	Total Credit Hours Attempted	Total Courses Withdrawn
Academic Status								
GPA 1st. Qtr. 1980	.24*	.30*	1.89*	-.20*	.23	.27	.13	-.26
GPA Difference from 1st. Qtr. to Final	.26*	.42*	2.24*	-.10*	.14	.21	.08	-.07
Hours 1st. Qtr.	-.002	-.02*	1.63*	.05*	-.008	-.06	.34	.21
Beginning Freshmen	-.08	-.05	—	-.02	-.02	-.01	—	-.006
Beginning Remedial Students	.50*	.54*	7.74*	-.02	.10	.09	.10	-.005
Graduate Students	.11	.19*	5.22*	.14	.03	.05	.11	.06
Transfer Average	.02	.04*	.54*	.08*	.02	.03	.03	.11
Transfer Credit Hours	.002	.005	.02	.007	.007	.02	.005	.03
Frequency of Library Checkouts	-.03*	-.04	-.32*	-.03*	-.02	-.03	-.02	-.04
Earned Degree	-.32*	-.43*	3.48*	-.52*	-.03	-.03	.02	-.06
Attended Summer Quarter	1.33*	.88*	11.56*	.18*	.42	.25	.25	.08
Courses Withdrawn	.04*	.05*	.29*	—	.03	.03	.01	—
Demographics								
Age	.002	—	-.07*	.005	.008	—	-.02	.03
Veteran Benefits	.06	.01	-.12	-.21*	.008	.001	-.001	-.04
Foreign Status	.18*	-.03	1.4*	-.16	.02	-.003	.01	-.03
Minority Female	.09*	.10	-.29	-.17*	.02	.02	-.004	-.05
Minority Males	-.05	.03	-.62	-.02	-.008	.005	-.007	-.003
Nonminority Female	-.03	-.08	-.81*	-.04	-.01	-.02	-.02	-.02
Moved	.25*	.42*	1.77*	.11*	.06	.09	.03	.03
Never Received Financial Aid	-.12*	-.14*	-3.63*	-.11*	-.03	-.03	-.06	-.04
Residency Status Gained	.15*	.44*	1.62*	-.11	.02	.05	.01	-.02
Course Contexts								
Average Class Size	.004*	.004*	-.01	-.003*	.03	.03	-.007	-.04
Average Class GPA	.15*	—	-1.53*	-.10	.06	—	-.04	-.06
Average Class Grade	.18*	.20*	2.15*	.23*	.07	.07	.06	.13
Average Class Credit Hrs. Attempted	-.002*	-.004*	.02*	-.001	-.06	-.10	.04	-.05
Percent Withdrawn from Class	-.006*	-.01*	-.17*	.04*	-.03	-.04	-.05	.22
Percent Minority Female	.009	.006*	-.008	-.002	.06	.05	-.004	-.02
Percent Minority Male	.006*	-.002	-.10*	-.003	.02	-.005	-.02	-.01
Percent Nonminority Female	-.003	-.002	-.09*	-.0007	-.03	-.02	-.07	.01
Percent Nonminority Male	.008*	.01*	-.004	.0005	.06	.10	-.003	.007
Academic Program								
Changed Major	.19*	.31*	2.20*	.05	.04	.05	.03	.02
Arts & Sciences	-.38*	-.40*	-4.75*	.09	-.11	-.10	-.09	.04
Business Administration	-.21*	-.21*	-1.94*	.07	-.07	-.06	-.04	.03
Education	-.53*	-.49*	-4.31*	.06	-.13	-.11	-.07	.02
Health Sciences	-.05	.02	1.52	-.02	-.01	.002	.02	-.005
Changed Major to:								
Arts & Sciences	-.08	-.05	-.58	.07	-.009	-.005	-.004	.01
Business Administration	.02	-.03	-.22	.01	.003	-.004	-.002	.002
Education	-.35*	-.15	-3.20*	.08	-.02	-.009	-.01	.007
Health Sciences	-.06	-.17	—	-.27	-.004	-.01	—	-.02
Course Subject Area								
AC	.16*	.18*	2.50*	.03	.09	.10	.10	.02
ART	.22*	.27*	2.73*	-.03	.10	.11	.09	-.02
BIO	.16*	.19*	2.49*	.02	.09	.09	.09	.02
CHEM	.09*	.11*	.59*	.04	.05	.05	.02	.03
CPS	.14*	.13*	1.74*	-.02	.09	.08	.08	-.02
DM	.23*	.26*	3.33*	-.05	.10	.10	.10	-.03
EC	.16*	.19*	2.43*	.06*	.07	.07	.07	.03
ECL	.12*	.13*	1.90*	-.01	.04	.04	.05	-.007
ENG	.21*	.25*	3.27*	.06*	.16	.17	.17	.07
ENG	.21*	.25*	2.59*	—	.07	.08	.06	—
FED	.15*	.27*	4.24*	-.07	.03	.04	.05	-.02
FI	.21*	.25*	2.87*	.02	.10	.11	.09	.02
FL	.19*	.21*	3.03*	.04	.04	.04	.05	.01
GEOL	.23*	.29*	3.67*	.04	.11	.12	.11	.03
HIST	.16*	.16*	1.87*	-.04	.07	.07	.06	-.02
IS	.16*	.18*	2.86*	.07*	.03	.02	.10	.03
MATH	.21*	.28*	3.16*	.06	.07	.08	.07	.03
PGT	.22*	.27*	3.15*	.06	.06	.06	.06	.02
PK	.06*	.08*	.87*	.004	.05	.07	.06	.006
PLS	.21*	.26*	3.23*	-.01	.06	.06	.06	-.005
PHIL	.12*	.17*	2.22*	.007	.03	.04	.04	.002
PHYS	.17*	.23*	3.43*	—	.06	.08	.09	—
POLS	.15*	.18*	2.27*	.02	.10	.10	.10	.02
PSY	.17*	.21*	1.62*	-.01	.06	.07	.04	-.005
Constant	.52	1.40	4.00	-.26				
R ² (Adjusted)	.70	.55	.83	.15	.70	.55	.83	.15
S.E.E.	.80	1.10	9.01	.99				
N	4841	4341	4041	4841	4841	4841	4841	4841

*Coefficient is twice or more its standard error.

- * GPA first quarter. This variable is one of the best indicators of attended quarters and class withdrawals. Apparently, the student's performance in the first quarter is a factor that is carried into their future course work. Students with higher first quarter GPA's attended more subsequent quarters and withdrew from fewer courses.
- * GPA difference from first quarter to final quarter. An increase in the student's cumulative GPA over his period of attendance is clearly related to his attending more quarters and withdrawing from fewer courses.
- * Hours attempted first quarter. While attempting more hours during first quarter does not seem to be generally associated with the total number of quarters attended, it is clearly associated with total hours attempted and total course withdrawals.
- * Beginning freshman. Having beginning freshman status is weakly associated with less persistence.
- * Beginning remedial students. Those who begin as developmental studies students tend to enroll for more quarters, and attempt about eight more credit hours than students who are not in the remedial program.
- * Graduate students. Graduate students attempt one course--about five credit hours--more. They also tend to withdraw from more courses.
- * Transfer average. Transfer students with higher transfer GPA's have a slight tendency toward greater persistence. The positive impact on total class withdrawals is higher than intuitively expected.
- * Transfer credit hours. The impact of this variable is similar to transfer GPA, but is weaker.

- * Frequency of library checkouts first quarter. This variable has a slight negative impact on the dependent variables.
- * Earned degree. As is to be expected, earning a degree during the five-quarter period is negatively related to total quarters attended. However, it is positively related to credit hours attempted.
- * Attended summer quarter. This variable was included solely as a control to avoid distorting the analysis if the student did not attend summer quarter.
- * Courses withdrawn from. This is a relatively weak indicator of persistence.

Demographic Background

These variables are indicators of a student's personal background. A summary of the demographic background findings include:

- * Age. It does not appear to be related to persistence.
- * Veteran benefits. Apparently, those students receiving veterans benefits withdraw from fewer courses than non-veterans, although they do not necessarily attend more quarters.
- * Foreign status. Students with foreign student status attend more quarters, take more credit hours and withdraw less. However, this variable has no impact on last quarter attended.
- * Minority females. Students in this group have a slightly greater likelihood of persisting as indicated by total quarters and last quarter attended. They also tend to withdraw from fewer courses.
- * Minority males. There is no discernible effect on persistence demonstrated by this indicator.

- * Non-minority females. This group shows a weak, negative relationship with measures of persistence.
- * Moved. This variable is an indicator of whether a student has changed his or her mailing address. Students who have moved are more likely to attend more quarters over a longer period of time than those who did not move.
- * Never received financial aid. Students who never received any direct financial aid through the university during their first five quarters appear to attend less than those who did. Students not receiving university financial aid attempted almost four credit hours less than students receiving aid.
- * Residency status gained. Gaining in-state residency status has some positive effect on attending the university. But the analysis shows that the effect is weak and less important, for example, than the effect of a student having moved while attending the university.

Course Context

These variables indicate the course environment experienced by the student. They are especially important for commuter students because this group probably has less interaction with student peers and faculty compared to students in residential universities. These contextual measurements of student course environment are related to the dependent variables in the following manner:

- * Average class size. This is a weak relationship. Students who have been in larger classes attend longer and withdraw from fewer courses.
- * Average class GPA. Students who have been in classes with higher average GPA's, attend more quarters and withdraw less. However,

they also attempt fewer credit hours.

- * Average class grade. Students in courses in which higher average grades are given have a consistent tendency to attend more quarters, attempt more hours, and withdraw from more courses.
- * Average class credit hours. Students who take classes with more experienced students (i.e., those in which the average accumulated credit hours of the students enrolled were higher) attend fewer quarters and attempt to take more hours.
- * Percent withdrew from classes. Students who enroll in classes having a greater number of withdrawals tend to withdraw from more courses themselves. Classes that have a large number of withdrawals are associated with decreased persistence, as indicated by total quarters attended, last quarter attended, and total credit hours.
- * Percent minority female. Students enrolled in classes with higher numbers of minority females have a slightly greater level of persistence.
- * Percent minority male. This variable appears to have no independent effect on attendance.
- * Percent non-minority female. Those students enrolling in classes having greater numbers of non-minority females attempt less hours.
- * Percent non-minority male. Enrolling in courses having more non-minority males tends to increase the number of quarters a student attends.

Academic Program

Several measures of academic program were used. These include the college housing the student's major, whether or not the student's major has changed, and, if it has, in which college the student is now majoring. The interesting

effects of these variables included:

- * Changed major. Students who changed majors attend more quarters over a longer period of time and take more hours. Changing colleges has no discernible effect on attendance patterns, except for students who have changed to Education, which appears to lower persistence.
- * College of major. Students majoring in the Health Sciences have a tendency to take more hours. The persistence of Business students is greater than students in Education or Arts and Sciences; however, a negative impact on persistence is linked with enrollment in all three colleges.

Course Subject Area

By counting the number of courses taken in selected subject areas, the impact of courses taken was measured. The association between course subject and persistence shows that:

- * Taking English and History courses is more indicative of taking more hours, attending more quarters, and dropping more courses than taking courses in other areas.

The results of a discriminant analysis of last quarter attended are presented in Table 2. Discriminant analysis was chosen so that those factors that maximize the differences between students based on last quarter attended could be identified. In addition, discriminant analysis helps to assess the impact of collinearity. For comparison purposes, a discriminant analysis was also performed on the variable that indicated total quarters attended in the study period.

Table 2
Discriminant Analysis of Last Quarter Attended
And Total Number of Quarters Attended

TOTAL STRUCTURE COEFFICIENT	LAST QUARTER ATTENDED				NUMBER OF QUARTERS ATTENDED						
	Function 1	Function 2	Function 3	Function 4	Function 1	Function 2	Function 3	Function 4			
Academic Status											
GPA Fall Quarter 1980	.31	-.15	-.33	-.21	.30	-.10	-.39	.002			
GPA Difference from Fall 1980 to Final	.10	.01	.15	.12	.05	-.05	-.01	-.11			
Hours 1st. Quarter	.37	-.007	-.07	.17	.39	-.15	.33	.03			
Beginning Freshmen	.13	.06	.006	.23	.11	-.35	.44	.04			
Beginning Remedial Students	.05	-.06	.02	.15	.05	-.16	.23	.06			
Graduate Students	-.06	-.12	.07	-.17	-.07	.14	-.38	.02			
Transfer Average	.07	.15	.003	-.01	.08	.22	-.04	-.004			
Earned Degree	.04	-.71	.37	-.09	.08	.004	.04	.22			
Courses Withdrew	.11	-.17	-.27	.18	.11	-.10	-.27	.12			
Demographics											
Foreign Status	-.10	.07	-.07	-.13	-.08	.14	-.01	-.09			
Minority Female	.007	-.002	-.07	.16	.008	-.007	-.04	-.06			
Minority Male	-.05	-.09	.10	.30	-.05	-.05	.10	.23			
Nonminority Female	-.02	-.10	-.05	.07	-.03	.01	-.18	.27			
Moved	.21	-.16	.05	.08	.18	-.11	-.17	.22			
Never Received Financial Aid	-.19	.003	.04	-.38	-.19	.05	-.05	-.20			
Course Context											
Average Class Size	.23	.23	-.25	.01	.20	-.37	.34	-.21			
Average Class GPA	.09	-.16	-.21	-.29	.07	.04	-.60	-.25			
Average Class Grade	.09	-.21	-.24	-.16	.07	-.05	-.54	-.16			
Average Class Credit Hours Attempted	.12	.09	.03	.08	.14	.19	-.007	-.02			
Percent Withdrew from Class	-.08	.05	-.02	.05	-.08	.10	-.19	.18			
Percent Minority Female	.05	-.22	-.06	.40	.05	-.25	.11	.27			
Percent Minority Male	-.007	-.11	-.09	.32	.003	-.19	.17	.19			
Percent Nonminority Female	.06	-.29	-.10	-.09	.04	-.09	-.40	.02			
Percent Nonminority Male	.16	.27	-.06	-.04	.14	-.02	.06	-.12			
Academic Program											
Changed Major	.26	-.01	.16	.06	.24	.01	.06	-.05			
Arts & Sciences	.01	.08	-.11	.30	.002	-.16	.09	.27			
Business Administration	.04	.20	.09	-.24	.04	.18	.02	-.24			
Education	-.08	-.12	.07	.09	-.08	.09	-.26	-.06			
Course Subject Area											
ART	.08	.02	-.04	.02	.07	-.10	.07	-.10			
BIO	.15	-.11	.001	-.09	.16	.02	-.13	.24			
CHEM	.12	-.04	.04	-.14	.12	.09	-.11	.17			
CPS	.10	.07	.14	-.12	.11	.35	-.12	.03			
DM	.25	.16	.23	-.13	.27	.36	.07	-.09			
ENG	.36	.17	-.03	.34	.34	-.34	.53	-.02			
FL	.15	.05	.01	.21	.14	-.04	.08	.23			
HIST	.30	.16	-.02	.27	.27	-.25	.37	-.004			
MATH	.24	.04	.09	.11	.24	.02	.16	.10			
MGT	.19	-.02	.19	-.25	.20	.21	-.02	-.16			
POLS	.28	.15	.09	-.04	.27	-.12	.36	-.09			
PSY	.21	.10	.02	.12	.20	-.05	.18	.10			
Group Centroid											
(1) Fall Quarter 1980	-1.55	.17	.18	.01	(1) 1 Qtr -1.59	.26	.17	.02			
(2) Winter Quarter 1981	-.71	-.09	-.46	-.22	(2) 2 Qtrs -0.73	-.21	-.36	-.19			
(3) Spring Quarter 1981	-.13	-.16	-.26	.28	(3) 3 Qtrs -0.10	-.28	-.20	.22			
(4) Summer Quarter 1981	.05	-1.10	.27	-.06	(4) 4 Qtrs .63	-.23	.24	-.04			
(5) Fall Quarter 1981	.74	.12	.05	-.02	(5) 5 Qtrs 1.11	.41	-.12	-.0007			
Eigenvalues											
	.81	.09	.04	.01	.96	.08	.05	.01			
Canonical Correlations											
	.67	.29	.20	.12	.70	.28	.22	.11			
Classification Results											
		Predicted Group (%)					Predicted Group (%)				
		(1) Fall Quarter 1980	(2) Winter Quarter 1981	(3) Spring Quarter 1981	(4) Summer Quarter 1981	(5) Fall Quarter 1981	(1)	(2)	(3)	(4)	(5)
Actual Group	(N)										
(1) Fall Quarter 1980	952	58	30	9	2	1	(1) 1 Qtr 952	61	29	8	1
(2) Winter Quarter 1981	471	21	43	22	5	8	(2) 2 Qtrs 638	24	41	23	7
(3) Spring Quarter 1981	578	13	22	33	8	24	(3) 3 Qtrs 767	12	24	32	20
(4) Summer Quarter 1981	294	9	17	21	29	24	(4) 4 Qtrs 1416	5	13	17	40
(5) Fall Quarter 1981	2546	4	14	16	6	61	(5) 5 Qtrs 1068	2	13	13	19
	4841						4841				

Percent correctly classified = 53%

Percent correctly classified = 46%

The total structure coefficients show the correlation between the individual variable and the function which is derived from the discriminant analysis procedure. The functions indicate those variables which best discriminate or differ between the various groups. An especially helpful consequence of the discriminant analysis technique is the procedure which predicts group membership and compares it to actual group membership.

The analysis reported in Table 2 clearly shows that the variables used in this study best predict attendance for one quarter and for still attending five quarters later. It is more difficult to predict those who attended more than one but less than five quarters. One-fourth of those students who had last attended Spring or Summer Quarter, but had not attended Fall Quarter, were predicted to have attended five quarters altogether. It is apparent that these variables are most accurate at predicting attendance for a short time--one quarter--or, for a long time--five quarters.

Summary

This study attempts to assess the effects that selected indicators of academic status, demographic background, course context, academic program, and course subject area have on persistence over a five-quarter period. The population for the study was all students who first attended the university Fall quarter, 1980. Their academic careers were then followed for five quarters at the university. Both multiple regression and multiple discriminant analyses were used to determine the relationship of the independent variables on total quarters attended, last quarter attended, total credit hours attempted, and total number of course withdrawals. The major findings of this study are:

- 1) Students who are likely to attend more quarters are those with higher GPA's in their first quarter, and those whose GPA's have increased over time. Students attempting more hours their first quarter continued to do the same in the following four quarters.
- 2) Students who have indicated a change of address attend more quarters. Students who had never received university financial aid attended fewer quarters. Gaining residency status, being a minority student or being a female student appear to have had little or no independent effect on attendance. Students receiving veterans' benefits and foreign students withdrew less frequently from courses.
- 3) Students enrolled in courses containing individuals with higher average GPA's and courses in which higher average class grades are given attend more quarters. Students enrolled in classes with high withdrawal rates seem to withdraw more. Students attend more when they are in classes having a high proportion of non-minority males.
- 4) Students who attended only Fall Quarter and students who attended all five quarters in the study period were more accurately predicted than students who fell in between these extremes.

Discussion

It is clear that an increase in persistence is an advantage to institutions that are trying to increase or maintain present levels of enrollment in an environment of scarcity. To cite a financial advantage, for example, if each new student took only one additional credit hour during his first five quarters, with 2,500 new students per quarter at \$25.00 per credit hours, a

university would increase its revenues by \$250,000 per year. It is also clear from the present study that academic performance is the prime factor in determining persistence. Thus, a half point increase in first quarter GPA would generate the addition 1 credit hour needed to increase revenues by a quarter of a million dollars per year.

In this study one of the best indicators of persistence in college is first quarter academic performance. This indicator showed a consistently heavy impact in each of the regression equations. Thus, a one point increase in first quarter GPA translates into: (a) an increase in total quarters attended by a factor of .26; (b) a decrease in course withdrawals by a factor of .20; (c) an increase in total credit hours attempted by a factor of 1.89; (d) an increase in last quarter attended by a factor of .30.

This finding confirms other studies (see particularly Pascarella, Duby, Miller and Rasher, 1981) which have shown that for urban, non-residential universities, first quarter academic performance is substantially more important than preenrollment characteristics in determining persistence. This accords with the common sense notion that the best measure of future performance in a particular environment is actual performance in that environment. In other words, the finding that actual academic performance is the best indicator of persistence, supports the argument that the particular college environment plays a larger role in academic success than preenrollment measures. Furthermore, for urban, non-residential universities, which presumably lack some of the extra-curricular inducements to persistence, academic performance is the best indicator of how well students have adjusted to their environment.

The contention that academic performance is the primary measure of adaptability to the college environment is supported by other research. Aitken (1982) has pointed out that measures of student satisfaction with their college

environment and hence measures of student integration into college life may generate paradoxical conclusions. Thus, it was found that students with higher academic performance tended to be more critical of academic facilities. It was also suggested that because of time allocation conflicts, students with high levels of peer relationships may suffer academically and thus be less persistent. For urban, non-residential universities these interpretations should be carefully considered before a campaign to increase student integration by making the university a more "social" or "likable" environment is undertaken. Commuter schools have a large population of working students for whom time allocations are more critical. Other considerations such as alumni support may merit campaigns to increase social integration in commuter universities, but the impact on persistence is not clear and may be mixed.

Academic performance, then, seems to be the least ambiguous measure of persistence and success in college. The degree to which this variable can be controlled by policy, however, is obviously very limited. Superficially, it may appear that easier grading would increase persistence. This may be true, but the long-range cost to the university would be felt in lower prestige and lower marketability. Another way that persistence could be increased may be to recruit students who are better able to cope with the academic environment of the university, that is, students who have more academic ability.

The latter approach is also dubious as a method to increase persistence. In the first place, as the present study shows, preenrollment measures of academic performance have a relatively minor independent impact on persistence when actual academic performance is included in the model. Of course, in lieu of actual performance in the present environment, performance in similar academic

environments would be the best indicator of academic performance. However, as the present study makes clear, a strict interpretation of academic achievement in previous environments would exclude students who would be good performers and persisters in the university seeking such students. There are two reasons for this. First, the variability of measuring standards precludes exact determination of previous academic success. Thus, a transfer student who has a mediocre GPA from a rigorous engineering college may be equivalent in academic ability to a student who has a high GPA from a junior college. Second, mere measurement of previous achievement does not consider changes in motivation and other individual circumstances that may tend to increase the probability of academic success. Therefore, greater selectivity in admission, if it were based on purely empirical evidence of prior academic success, would exclude students who would achieve and persist in a new environment.

Of course, the option of greater selectivity in a period of increasing scarcity is not appealing. In this sense, the cost of increasing persistence is the lower number of students who start the race. Conceivably, there may be some balance between selectivity and absolute new student enrollments that would maximize the cost efficiency of the university. However, even this is a dubious conjecture, because teachers tend to grade students according to relative ability rather than absolute ability. The result of such grading for a university that sought to increase persistence through better admission selectivity would be that the students who dropped out would not have dropped out under less stringent circumstances.

Thus, when persistence is considered as a primary consequence of academic success, the policy options opened to the university, particularly the commuter university, are limited. There may be some radical options. For example, one

way to get around the relative grading pattern would be to make advancement dependent upon the completion of standardized exams. This would eliminate the grade deflation that results from greater selectivity and relative grading. Another solution may be to focus more attention on students who are not likely to persist in hope of increasing their academic ability. However, such a costly policy is likely to negate to some extent the economic efficiency sought through increased persistence.

Another academic factor that affects persistence is an improvement in academic performance. This variable was measured by recording the difference between the first quarter GPA and the final cumulative GPA at the end of a five-quarter period. Thus, it was found that independent of first quarter GPA an improvement in GPA will increase persistence, which means that the persistence of even poor students will be increased if they can make progress in their academic performance. One policy implication of this finding is that an institution may be able to improve persistence by enhancing its guidance function. Students who can be more quickly routed to academic programs in which they stand a better chance of success will be less likely to drop out. Such a policy may include the need for a university guidance program as opposed to an academic unit guidance program. Academic unit centered guidance tends to think only in terms of its own programs. A university guidance program would be able to direct students into appropriate academic programs irrespective of academic divisions. The importance of early guidance is underscored by the fact that thirty percent of the beginning students in this study did not make it past their second quarter.

The present study supports the assertion that more timely and appropriate guidance would increase persistence. For example, the data show that students

who have changed their majors are less likely to drop out. It was found that each additional quarter in attendance increases the percentage of students who have changed their major. This process seems to peak at about the fourth quarter. Thus, the percentage of major changes for students who had attended four quarters was a seven point increase over students who had attended three quarters (10.56 to 17.51). Students who had attended five quarters, however, only increased their percentage of major changes by an additional four points (17.51 to 20.69). It appears, therefore, that more timely intervention in the form of appropriate guidance would shift the percentage of major changes to earlier quarters and accelerate the process by which students adapt to the academic environment. The causality, however, is not clear. Students who attend longer have more time in which to change major. Thus, major change is to an extent dependent upon time in attendance and time in attendance is dependent upon major change. Nevertheless, it is clear that over 20 percent of the students who have persisted for more than four quarters have changed their majors, which demonstrates that students are trying to adapt to their new environment. The extent to which this adaptation can be helped by guidance may influence persistence in the university.

Other findings related to academic program also suggest the role that guidance could play to increase student persistence. Students in the three major colleges--Arts and Sciences, Business and Education--all show lower rates of persistence than students in the colleges of Health Sciences, or Public Affairs. However, where being a business student lowers the total number of hours attempted by a factor of almost 2, being an Arts and Science student lowers the total number of hours by a factor of 4.75--more than twice the impact. The college of Education has an impact on persistence more similar to Arts and Sciences than Business. These findings suggest two things. First, they verify the

findings of other research (Simpson, Baker, and Mellinger, 1980), that students in vocationally oriented programs are more likely to persist. Second, the findings suggest that those students who come to the university with more clearly defined goals are less likely to drop out than students who come to college for idealistic, vague or unrealistic reasons. The inference, of course, is that those students with narrowly defined objectives are to be found in vocationally oriented programs while those students with more idealistic--perhaps more vague--concerns are found in the liberal arts.

The above findings indicate that a guidance program that had a university-wide perspective would benefit both the student oriented toward a career and the student who has more academic or intellectual interests. Students could be guided into the academic program that fit their academic, career and emotional needs by counselors who were familiar with the total academic resources of the university. Counselors would not have a vested interest in promoting one college over another, which may have the effect of increasing the number of students who are in career-oriented programs such as business, and retaining students, rather than having them drop out. Moreover, it is conceivable that under such a guidance system, academic programs like Arts and Sciences would be strengthened, because they would be perceived positively as programs for scholarly activity rather than negatively as programs for students who could not decide what they wanted to do.

The discriminant analysis also shows the strong impact of post enrollment variables such as first quarter GPA on persistence. In addition, the discriminant analysis indicates the strong influence of two academic status variables that did not appear to be strong in the multivariate regression. Hours taken first quarter with a total structure coefficient of .37 had the highest correlation

with the first discriminant function. The variable indicating beginning freshman, with a structure coefficient of .13, also appears to have a greater impact than measured in the multivariate regression.

This difference between the multivariate regression and the discriminant analysis is apparently related to the problem of data collinearity (see Belsley, Kuh, and Welsh, 1980, Chapter 3). The multivariate regression measures the impact of a particular independent variable by controlling the variability in all the other independent variables. When several independent variables are related to each other to the extent that they vary together in the same degree and direction, the problem of collinearity exists. Collinearity may then hide the univariate impact of some variables. This univariate impact is brought out by structure coefficients in the discriminant analysis, because they show the univariate correlation between a variable and the equation that had the best ability to differentiate between groups.

The finding of this difference between the two types of analysis illustrates the complexity of the relationships that influence persistence. The strong impact of first quarter GPA cannot be denied. However, it may in turn be caused by a factor that not only affects GPA, but also affects first quarter hours and whether a student is a beginning freshman. This causal factor may be most simply conceptualized as the ability to adapt.

The picture that then emerges is that the persistent student is a student who can adapt to the college environment. Making passing grades appears to be the primary way that this adaptation is recorded. However, other measures show that the ability to adapt--to figure out the system--is the causal factor behind persistence. Seen as measures of adaptation, the variables in this study take on a more interpretable meaning. Thus, the following points can be made:

1. A high GPA is a measure of adaptation to the variety of teachers and course material in the college environment.

2. Students who increase their GPA over time are learning how to respond to the social and academic cues of their new academic environment.

3. Students in vocationally oriented programs where the cues for appropriate academic behavior are more clearly defined are better able to read their college environment and thus are more persistent.

4. Traditional full-time students, students who take more hours per quarter, have more exposure to the college environment and are better able to adapt.

5. Part-time students, students who take less hours per quarter, may have time allocation conflicts that lower their ability to become integrated in the college environment. In addition, part-time students may have conflicting conceptual maps because of differences in the behavioral requirements between school and work.

6. Graduate students are more persistent because they have learned the behavior appropriate to academic life over the years and were successful in their undergraduate adaptation.

7. Students who changed their address during the study period were found to be more persistent. Moving, therefore, may be a sign of greater ability to adapt to new circumstances and thus to college life.

8. Non-minority males seem to be more persistent perhaps because the university teaching environment is dominated by non-minority males. It is thus easier for non-minority males to pick up the cues of adaptive academic behavior.

9. Students who receive financial aid or have gained residency status do

not have the adaptive process complicated by financial problems.

10. Students who change majors are more persistent and demonstrate adaptive behavior.

11. Withdrawing from courses as an independent variable has a positive impact on persistence. This means that adaptive students learn to read a course before they are graded. Such students have learned to avoid academic difficulty better than non-adaptive students.

The thesis that the ability to adapt is the factor behind the measurable indicators of persistence is also supported by an analysis of the course contextual variables. These variables were constructed to give an indication of the academic and social context of the classrooms to which each student was exposed over his attendance period.

The contextual variables show that students who were in classes that were larger than average were more likely to persist in college. Such classes may tend to be "textbook" type courses where the content is relatively straightforward and easily decipherable. Conversely, smaller classes may add to the complexity of interpersonal adjustments between teacher and student. In addition, larger classes would tend toward objective-type testing which may require less adaptive skill than essay-type testing.

The contextual variable called "Average Class GPA" may be considered to represent the level of the competition in the classroom environment. A one point increase in the average class GPA was shown to increase the total quarters attended by a factor of .15. However, this variable tended to decrease the total credit hours attempted. Seemingly the indication is that persistent students may be relatively confident of their adaptive abilities and thus are more

willing to further test their adaptive skill against stiffer competition. The fact that the total hours attempted goes down for this variable suggests that adaptive students adjust their course load when faced with more difficult courses.

"Average Class Grade" is the contextual variable that measured the grading environment to which a student was exposed. The analysis shows that persistence increases with increases in the average class grade. The implication is that adaptive students are finding those less difficult courses that allow them to persist in college. It is interesting to compare this variable with the "Average Class GPA" variable discussed above. Whereas this variable shows an increase in hours attempted of 2.15 for each one point gain in average class grade, the Average Class GPA variable shows a decrease. This again suggests appropriate adaptive behavior. When students are in easier courses, they take more hours.

The contextual variable called "Average Class Credit Hours Attempted" was constructed to measure the degree of experience of the competition to which a student was exposed. This variable shows that students who attend courses with other students who have had more academic experience tend not to persist. This variable thus illustrated the role that adaptive experience plays in academic success, because it shows that previous adaptive behavior gives academic advantage.

It was stated above that students who withdrew from courses had a tendency to be more persistent in college. However, the contextual variable that measures the extent of withdrawals in the courses taken by a student indicates that withdrawal from a course is adaptive so long as the course is not one that normally generates withdrawals. The suggestion here is that there are two levels in picking and reading course options. First, there is the pre-registration level in which the adaptive student knows those courses that are to be avoided if possible. Second, there is the post-registration level in which the adaptive student sizes

up a situation for which there was relatively little prior information. Thus, the variable that measures the degree of withdrawals in the courses taken by a student shows that persistence decreases when the student consistently registers for courses that have heavy withdrawal rates.

Finally, the course context variables that measured the percent of minority, non-minority, male and female of the courses taken by a student show that these variables give inconsistent results across the different indicators of persistence. However, it does appear that classes with higher percentages of either minority females or non-minority males tend to increase persistence. This suggests that persistence may be related to the degree of social integration. (See Emile Durkheim). Social integration is itself an indicator of adaptive ability.

In summary, it appears that persistence is best conceived as a problem involving social adaptation. A good measure of this adaptation is first quarter academic performance. The university could emphasize several activities to increase adaptation. Students could be given earlier guidance and guidance that does not constrict their adaptive potential by binding it to the academic program of the counselor. Attempts could be made to give out more information to students about course content, teachers, evaluations, and grading patterns. Recruitment of more traditional, full-time students would increase persistence.

However, an increase in persistence may in some respects go against the function of the university--and hence reduce its own ability to adapt to the social environment. It may be that the function of the university is to separate those who can adapt to the particular milieu that it offers from those who cannot. The university milieu may require the same adaptive skills as other aspects of organizational life in the 20th century. To the extent it does, the

university has adapted to its social function. Thus, persistence in college from this perspective is more related to social and political factors that are external to the university, even as the university becomes the primary instrument for applying these factors.

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Means by Last Quarter Attended and Total Quarters Attended by Various Measures
Of Academic Status, Demographics, Course Context, Academic Program, and Course Subject Area

VARIABLES	LAST QUARTER ATTENDED						UNIVARI- ATE F	TOTAL QUARTERS ATTENDED						UNIVARI- ATE F
	FALL	WINTER	SPRING	SUMMER	FALL	TOTAL		1 QTR	2 QTRS	3 QTRS	4 QTRS	5 QTRS	TOTAL	
Academic Status														
GPA 1st Qtr.	1.45	2.21	2.24	2.37	2.49	2.22	101.5	1.45	2.14	2.32	2.39	2.69	2.22	116.8
GPA Difference, 1st. to Last Qtr.	.02	-.01	.10	.14	.18	.12	11.0	.02	.13	.12	.15	.15	.12	3.8
Hours 1st Qtr.	7.58	8.92	10.12	9.99	11.15	10.04	132.3	7.58	8.46	9.80	11.54	11.42	10.34	186.5
Beginning Freshmen	7.88	9.13	15.57	11.91	17.60	14.27	17.0	7.88	8.31	14.47	23.12	11.60	14.27	37.6
Beginning Remedial Students	6.83	7.01	10.21	10.84	9.86	9.09	3.1	6.83	6.27	9.26	12.62	8.05	9.09	6.8
Graduate Students	32.77	31.42	27.16	36.05	26.39	28.02	6.1	32.77	35.74	30.90	21.14	29.96	28.92	16.3
Transfer Average	1.00	1.02	1.05	.89	1.20	1.10	6.7	1.00	.98	1.07	1.09	1.35	1.10	11.7
Earned Degree	.00	.00	1.21	11.22	.98	1.34	62.7	.00	.00	1.70	1.92	2.34	1.34	8.5
Courses Withdrew	.39	.66	.78	.75	.68	.64	18.0	.39	.66	.74	.66	.75	.64	18.8
Demographics														
Foreign Status	6.72	6.16	3.46	2.04	2.51	3.78	11.0	6.72	4.70	2.87	2.27	3.28	3.78	8.8
Minority Female	11.03	11.47	13.67	10.88	11.67	11.71	.7	11.03	12.38	11.60	11.70	12.08	11.71	.2
Minority Male	7.46	4.03	7.27	7.82	4.40	5.52	5.4	7.46	4.70	6.65	5.39	3.65	5.52	4.1
Nonminority Female	45.06	46.07	46.89	48.64	42.69	44.35	1.8	45.06	45.77	48.89	40.64	44.20	44.35	3.8
Moved	1.89	7.43	13.50	19.73	17.79	13.26	45.9	1.89	10.19	16.30	16.24	19.20	13.26	42.1
Never Received Financial Aid	93.70	89.81	78.72	82.99	77.14	82.17	39.7	93.70	89.19	81.10	77.09	75.09	82.17	44.2
Course Context														
Average Class Size	27.02	30.91	31.92	27.81	34.39	31.91	63.0	27.02	29.94	31.52	35.94	32.33	31.91	66.6
Average Class GPA	2.51	2.70	2.63	2.72	2.66	2.63	14.1	2.51	2.76	2.66	2.57	2.74	2.63	28.5
Average Class Grade	2.57	2.76	2.72	2.81	2.72	2.70	16.4	2.57	2.81	2.74	2.66	2.77	2.70	24.5
Average Class Credit Hrs. Attempted	76.63	78.40	83.03	80.22	88.01	83.77	16.0	76.63	78.13	80.88	85.45	93.35	83.77	25.5
Percent Withdraw from Class	11.18	10.63	10.42	9.82	9.89	10.28	7.7	11.18	10.76	10.65	9.41	10.07	10.28	11.8
Percent Minority Female	10.88	11.30	13.41	13.86	11.98	11.98	10.5	10.88	11.28	12.92	12.95	11.43	11.98	11.0
Percent Minority Male	5.53	5.56	6.22	5.99	5.50	5.63	3.6	5.53	5.36	5.90	5.98	5.21	5.63	5.8
Percent Nonminority Female	36.83	40.17	40.00	44.15	39.41	39.33	13.1	36.83	41.40	40.95	38.51	40.23	39.33	12.2
Percent Nonminority Male	32.32	34.07	34.77	31.09	37.97	35.68	34.2	32.32	34.18	34.95	37.39	37.81	35.68	22.7
Academic Program														
Changed Major	.32	3.61	10.38	14.29	18.46	12.23	66.8	.32	6.11	10.56	17.52	20.69	12.23	67.7
Arts & Sciences	21.74	21.44	26.82	17.01	23.02	22.70	3.0	21.74	20.53	26.21	24.75	19.66	22.70	4.2
Business Administration	36.24	35.24	30.62	28.23	39.51	36.71	6.9	36.24	35.42	31.42	36.45	42.04	36.71	5.7
Education	19.43	15.71	16.61	20.41	12.77	15.29	6.0	19.43	20.53	16.04	10.43	14.42	15.29	13.2
Course Subject Area														
ART	.02	.08	.11	.10	.16	.11	7.1	.02	.09	.10	.18	.14	.11	7.9
BIO	.06	.20	.24	.38	.35	.27	24.8	.06	.17	.31	.31	.42	.27	30.3
CHEM	.03	.12	.13	.23	.24	.17	14.0	.03	.09	.19	.19	.31	.17	18.7
CPS	.03	.03	.04	.11	.22	.13	10.6	.03	.03	.05	.10	.40	.13	28.1
DM	.02	.05	.12	.16	.35	.22	67.3	.02	.04	.12	.28	.48	.22	97.0
ENG	.14	.35	.73	.49	.99	.70	129.7	.14	.32	.65	1.14	.88	.70	158.7
FL	.03	.07	.20	.14	.25	.18	22.7	.03	.06	.20	.25	.27	.18	25.0
HIST	.06	.17	.35	.22	.49	.34	90.1	.06	.16	.32	.55	.44	.34	101.8
MATH	.05	.13	.28	.29	.43	.30	56.1	.05	.11	.27	.43	.47	.30	67.8
MGY	.03	.07	.09	.20	.22	.15	38.7	.03	.08	.10	.19	.30	.15	51.7
POLS	.04	.12	.20	.19	.38	.25	80.7	.04	.11	.21	.41	.36	.25	93.3
PSY	.04	.15	.31	.23	.48	.33	43.3	.04	.12	.31	.50	.49	.33	49.3
(n)	952	471	578	294	2546	4841	4841	952	638	767	1416	1,068	4841	4841